

**Abstract of the Invention**

An in-line system and method for determining T-top gate dimensions is provided. The system comprises a wafer structure undergoing a T-top gate formation process; a scatterometry system coupled to the formation process for directing light at and collecting reflected light from the wafer structure; a signature store; a T-top gate formation analysis system coupled to the scatterometry system and to the signature store for determining the T-top gate dimensions; and a feedback control system coupled to the T-top gate formation analysis system for optimizing T-top gate formation. The method comprises providing a wafer structure having a T-top gate formed thereon; generating a signature associated with the T-top gate; comparing the generated signature with a signature store to determine the dimensions of the T-top gate; if the dimensions of the T-top gate are not within a pre-determined acceptable range, then adjusting T-top gate process parameters using feedback control.

Q1 Q2 Q3 Q4 Q5 Q6 Q7 Q8 Q9 Q10 Q11 Q12 Q13 Q14 Q15 Q16 Q17 Q18 Q19 Q20 Q21 Q22 Q23 Q24 Q25 Q26 Q27 Q28 Q29 Q30 Q31 Q32 Q33 Q34 Q35 Q36 Q37 Q38 Q39 Q40 Q41 Q42 Q43 Q44 Q45 Q46 Q47 Q48 Q49 Q50 Q51 Q52 Q53 Q54 Q55 Q56 Q57 Q58 Q59 Q60 Q61 Q62 Q63 Q64 Q65 Q66 Q67 Q68 Q69 Q70 Q71 Q72 Q73 Q74 Q75 Q76 Q77 Q78 Q79 Q80 Q81 Q82 Q83 Q84 Q85 Q86 Q87 Q88 Q89 Q90 Q91 Q92 Q93 Q94 Q95 Q96 Q97 Q98 Q99 Q100